State/Industry Ambient Monitoring Network

Air Quality Report

2nd Quarter 2010

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Air Quality Monitoring Branch
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North Dakota Department of Health

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SECTION ONE

DISCUSSION OF

MONITORING RESULTS

Sulfur Dioxide (SO_2)

There were no exceedances of either the state or the federal standards during the quarter. The highest 1─hour concentration was 165 ppb at DGC #12; the highest 3─hour concentration was 96 ppb at Hess ─ Tioga #3; and, the highest 24─hour concentration was 49 ppb at Hess ─ Tioga #3. The highest arithmetic mean was 2.6 ppb at Hess ─ Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

Sulfur Dioxide (SO_2) 5─Minute Average

The highest 5─minute concentration was 371 ppb at Hess ─ Tioga #3. All sites achieved at least an 80% data recovery for the period operated.

Trace Level Sulfur Dioxide (SO_2)

There were no exceedances of either the state or the federal standards during the quarter. The highest 1─hour concentration was 84.7 ppb at Lostwood NWR; the highest 3─hour concentration was 45.0 ppb at Lostwood NWR; and, the highest 24─hour concentration was 20.0 ppb at Lostwood NWR. The highest arithmetic mean was 1.4 ppb at Lostwood NWR. All sites with the acceptation of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% data recovery due to a Lightning strike.

Trace Level Sulfur Dioxide (SO_2) 5─Minute Average

The highest 5─minute concentration was 122.0 ppb at Lostwood NWR. All sites with the acceptation of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% data recovery due to a Lightning strike.

Ozone (O_3)

There was no exceedance of the ozone standard during the quarter. The highest observed 1–hour concentration was 74 ppb at Hannover and Lostwood NWR. The highest 4th highest 8–hour concentration was 63 ppb at Fargo NW and Lostwood NWR. All sites with the acceptation of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% data recovery due to a Lightning strike.

Nitrogen Dioxide (NO_2)

The highest observed 98th Percentile concentration was 43 ppb at Fargo NW. The highest arithmetic mean concentration was 6.7 ppb at Fargo NW. All sites with the acceptation of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% data recovery due to a Lightning strike.

Carbon Monoxide (CO)

The highest observed 1–hour concentration was 765 ppb at Fargo NW. The highest 8–hour concentration was 500 ppb at Fargo NW. The site achieved at least an 80% data recovery for the period operated.

Ammonia (NH_3)

The highest 1–hour concentration was 204.0 ppb at Beulah – North. All sites achieved an 80% data recovery for the period.

The data is used as part of the ambient data input used by the newer dispersion models.

Inhalable Continuous PM_{fine} Particulates

The highest 24–hour concentration was 24.0 µg/m^3 at Lostwood NWR. The highest arithmetic mean concentration was 6.6 µg/m^3 at Hannover. All sites with the acceptation of Dunn Center achieved at least an 80% data recovery for the period operated. Dunn Center failed to achieve 80% data recovery due to a Lightning strike.

The analyzer used to collect the PM_{fine} at the sites were required by EPA, but never given the reference or equivalent designation. Therefore, the data can only be used as an indicator of PM_{fine} concentrations.

Inhalable PM_{fine} Particulates

There was no exceedance of the 24–hour standard during the quarter. The highest 24–hour average concentration was 32.6 µg/m^3 at Fargo NW (BAMM). The highest weighted mean was 10.23 µg/m^3 at Fargo NW (BAMM). All sites achieved at least an 80% data recovery for the period operated.

Inhalable Continuous PM_{10} Particulates

There was no exceedance of the 24–hour standard during the quarter. The highest 24–hour concentration was 39.0 µg/m^3 at Bismarck Residential. The highest arithmetic mean was 12.0 µg/m^3 at Bismarck Residential. All sites achieved an 80% data recovery for the period.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT: **Sulfur Dioxide** (ppb)

LOCATION	YEAR	NUM OBS	MAX 1 — HOUR 1ST	MAX 1 — HOUR 2ND	MAX 3 — HOUR 1ST	MAX 3 — HOUR 2ND	24 — HOUR 1ST	24 — HOUR 2ND	ARITH MEAN	1HR #>273	24HR #>99
Bear Paw - MGP #3	2010	4296	28	22	19	12	5	2	1.1		
Bear Paw - MGP #5	2010	4306	30	22	20	9	5	3	1.2		
Beulah - North	2010	4284	164	70	86	33	16	11	1.9		
Bismarck Residential	2010	4312	64	41	38	25	9	9	1.9		
DGC #12	2010	4319	165	62	83	36	15	14	1.8		
DGC #14	2010	4294	70	65	48	46	15	10	1.8		
DGC #16	2010	4312	143	54	82	26	12	11	1.8		
DGC #17	2010	4319	117	60	69	28	11	11	1.7		
Hannover	2010	4272	122	66	65	30	11	6	1.9		
Hess - Tioga #1	2010	4078	30	29	14	13	5	5	1.4		
Hess - Tioga #3	2010	4282	151	141	96	78	49	22	2.6		
TRNP - SU	2010	4111	15	10	10	7	3	2	1.1		

The highest 1-hour concentration is 165 ppb at DGC #12
The highest 3-hour concentration is 96 ppb at Hess - Tioga #3
The highest 24-hour concentration is 49 ppb at Hess - Tioga #3
The highest arithmetic mean is 2.6 ppb at Hess - Tioga #3

* The air quality standards are:
STATE Standards —
1) 273 ppb highest 1—hour average concentration.
2) 99 ppb highest 24—hour average concentration.
3) 23 ppb highest annual arithmetic mean concentration.

FEDERAL Standards —
1) 500 ppb highest 3—hour concentration not to be exceeded more than once per year.
2) 140 ppb highest 24—hour concentration not to be exceeded more than once per year.
3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : **Sulfur Dioxide 5—Minute Averages** (ppb)

LOCATION	YEAR	NUM OBS	5 — M I N U T E M A X I M A 1ST	2ND	3RD	# HOURS >600
Bear Paw - MGP #3	2010	4296	78	33	29	
Bear Paw - MGP #5	2010	4306	137	35	34	
Beulah - North	2010	4284	202	162	142	
Bismarck Residential	2010	4312	108	78	56	
DGC #12	2010	2170	151	96	55	
DGC #14	2010	2147	65	63	60	
DGC #16	2010	2171	99	92	79	
DGC #17	2010	2174	79	59	46	
Hannover	2010	4272	181	137	102	
Hess - Tioga #1	2010	3937	103	84	70	
Hess - Tioga #3	2010	4282	371	308	293	
TRNP - SU	2010	4111	19	17	12	

The highest 5-minute concentration is 371 ppb at Hess - Tioga #3

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : **Trace Level Sulfur Dioxide** (ppb)

LOCATION	YEAR	NUM OBS	MAXIMA 1 — HOUR 1ST	1 — HOUR 2ND	3 — HOUR 1ST	3 — HOUR 2ND	24 — HOUR 1ST	24 — HOUR 2ND	ARITH MEAN	1HR #>273	24HR #>99
Dunn Center	2010	2691 ***	25.8	19.0	16.0	13.0	4.0	3.0	0.7		
Fargo NW	2010	4294	7.8	6.1	4.0	3.0	2.0	2.0	0.4		
Lostwood NWR	2010	4273	84.7	84.0	45.0	40.0	20.0	13.0	1.4		
TRNP - NU	2010	4310	13.5	11.7	9.0	8.0	3.0	3.0	0.6		

The highest 1-hour concentration is 84.7 ppb at Lostwood NWR
The highest 3-hour concentration is 45.0 ppb at Lostwood NWR
The highest 24-hour concentration is 20.0 ppb at Lostwood NWR
The highest arithmetic mean is 1.4 ppb at Lostwood NWR

* The air quality standards are:
STATE Standards —
1) 273 ppb highest 1—hour average concentration.
2) 99 ppb highest 24—hour average concentration.
3) 23 ppb highest annual arithmetic mean concentration.

FEDERAL Standards —
1) 500 ppb highest 3—hour concentration not to be exceeded more than once per year.
2) 140 ppb highest 24—hour concentration not to be exceeded more than once per year.
3) 30 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : **Trace Level Sulfur Dioxide 5—Minute Averages** (ppb)

LOCATION	YEAR	NUM OBS	5 — MINUTE MAXIMA 1ST	2ND	3RD	# HOURS >600
Dunn Center	2010	2691 ***	30.7	28.5	25.3	
Fargo NW	2010	4295	12.5	9.5	9.4	
Lostwood NWR	2010	4273	122	109	105	
TRNP - NU	2010	4310	17.6	17.3	16.5	

The highest 5-minute concentration is 122 ppb at Lostwood NWR
* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ozone (ppb)

LOCATION	YEAR	NUM OBS	MAXIMUM 1 – HOUR 1ST	2ND	MAXIMUM 8 – HOUR 1ST	2ND	3RD	4TH	8HR >75
Beulah North	2010	4264	71	66	60	58	56	55	
Bismarck Residential	2010	4274	67	66	64	63	62	61	
Dunn Center	2010	2694 ***	68	64	66	62	59	58	
Fargo NW	2010	4269	72	71	67	66	64	63	
Hannover	2010	4275	74	68	68	67	65	61	
Lostwood NWR	2010	4274	74	71	67	65	64	63	
TRNP - NU	2010	4310	73	67	70	66	65	62	
TRNP – SU	2010	4111	69	65	67	62	61	61	

The highest 1–hour concentration is 74 ppb at Hannover and Lostwood NWR
The 4th highest 8–hour concentration is 63 ppb at Fargo NW and Lostwood NWR

* The air quality standards for ozone are:
STATE - 120 ppb highest 1-hour not to be exceeded more than once per year.

FEDERAL Standards – Fourth highest daily highest 8–hour averages for a 3–year period not to exceed 75 ppb.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	NUM OBS	1 - HOUR 1ST	1 - HOUR 2ND	ARITH MEAN	98th %
Beulah - North	2010	4034	48	41	3.0	24
Bismarck Residential	2010	4302	55	45	6.0	36
DGC #12	2010	4307	46	37	2.9	19
DGC #17	2010	4289	30	28	2.5	19
Dunn Center	2010	2641 ***	24	20	1.6	8
Fargo NW	2010	4273	58	53	6.7	43
Hannover	2010	4259	25	25	2.4	14
Lostwood NWR	2010	4268	29	25	2.2	18
TRNP - NU	2010	3852	10	10	1.4	7

The highest 98th percentile is 43 ppb at Fargo NW

The highest Arithmetic Mean concentration is 6.7 ppb at Fargo NW

* The air quality standards are:
  STATE - 53 ppb maximum annual arithmetic mean.

  FEDERAL - 100 ppb 98th percentile
          - 53 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : CARBON MONOXIDE (PPB)

LOCATION	YEAR	NUM OBS	MAX 1 - HOUR 1ST	MAX 1 - HOUR 2ND	MAX 8 - HOUR 1ST	MAX 8 - HOUR 2ND	1HR #>35000	8HR #>9000
Fargo NW	2010	4295	765.0	735.0	500.0	500.0		

* The STATE and FEDERAL air quality standards are:
  1) The highest allowable 1–hour concentration is 35000 ppb not to be exceeded more than once per year.
  2) The highest allowable 8–hour concentration is 9000 ppb not to be exceeded more than once per year.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ammonia (ppb)

LOCATION	YEAR	NUM OBS	MAX 1 – HOUR 1ST	2ND	3RD	4TH
Beulah – North	2010	4255	204.0	83.0	82.0	78.0
Lostwood NWR	2010	3779	53.0	49.0	40.0	37.0

The highest 1-hour concentrations is 204.0 at Beulah - North

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous PM_{fine} Particulates ($\mu g/m^3$)

LOCATION	YEAR	NUM OBS	MAX 1 – HOUR 1ST	2ND	MAX 24 – HOUR 1ST	2ND	3RD	4TH	MEAN	24HR #>35	AM>15
Beulah - North	2010	4275	67.6	56.3	20.7	16.6	13.9	13.6	3.8		
Dunn Center	2010	2674 ***	32.3	30.1	13.0	12.8	12.2	9.8	3.9		
Fargo NW	2010	2388 ***	60.4	56.9	18.0	13.3	11.2	11.1	5.0		
Hannover	2010	3812	46.3	39.9	17.7	16.7	15.3	14.6	6.6		
Lostwood NWR	2010	3956	31.4	29.8	24.0	20.7	15.4	14.4	3.6		
TRNP - NU	2010	4176	25.9	24.4	15.4	15.0	13.1	12.5	3.1		
TRNP - SU (Painted Canyon)	2010	3867	23.2	21.0	15.2	14.5	14.5	3.8	6.1		

The highest 24-hour concentration is 24.0 µg/m3 at Lostwood NWR
The highest Annual Mean concentration is 6.6 µg/m3 at Hannover

* The EPA–required analyzer used to collect this data is not a reference or equivalent method; this data cannot be compared to the PM_{fine} standards. This data can only be used as an indicator of the actual PM_{fine} ambient concentrations. If this data were to indicate there may be an exceedance of the ambient standards, then the department could be required to install a designated reference or equivalent sampler.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : **Inhalable PM_{fine} Particulates** ($\mu g/m^3$)

LOCATION	YEAR	OBS	MIN	MAXIMA 1ST	2ND	3RD	98th %	WTD MEAN	#>35	AM>15
Beulah - North	2010	29		14.9	13.9	13.5	14.9	6.10		
Bismarck Residential	2010	58		23.6	17.5	17.3	17.5	8.56		
Bismarck Residential (BAMM)	2010	4247 ***		30.0	25.9	25.5	21.0	7.83		
Fargo NW	2010	59		30.3	28.0	26.7	28.0	9.36		
Fargo NW (BAMM)	2010	1827 ***		32.6	23.0	21.0	23.0	10.23*		
TRNP - SU (Painted Canyon)	2010	27		12.7	9.9	8.8	12.7	4.80		

The highest 24-hour concentration is 32.6 µg/m3 at Fargo NW
The highest Annual Weighted Mean concentration is 10.23 µg/m3 at Fargo NW

* The ambient air quality standards are:
FEDERAL Standards —
1) 24—hour: 3—year average of 98th percentiles not to exceed 35 $\mu g/m^3$.
2) Annual: 3—year average not to exceed 15 $\mu g/m^3$.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous PM_{10} Particulates ($\mu g/m^3$)

LOCATION	YEAR	NUM OBS	24 — MAX HOUR 1ST	2ND	3RD	4TH	WTD MEAN	#>150	AM>50
Beulah - North	2010	4021	32.0	31.0	28.0	27.0	9.9		
Bismarck Residential	2010	4133	39.0	35.0	34.0	32.0	12.0		
Dunn Center	2010	2321 ***	32.0	32.0	31.0	29.0	9.7		
Fargo NW	2010	4307	28.0	20.0	19.0	18.0	7.8		
Lostwood NWR	2010	4117	30.0	27.0	27.0	22.0	9.1		
TRNP - NU	2010	4294	29.0	26.0	25.0	24.0	7.9		

The highest 24-hour concentration is 39.0 µg/m3 at Bismarck Residential
The highest Annual Mean concentration is 12.0 µg/m3 at Bismarck Residential

* The STATE and FEDERAL air quality standards are:
1) 150 $\mu g/m^3$ highest averaged over a 24—hour period with no more than one expected exceedance per year.
2) 50 $\mu g/m^3$ expected annual arithmetic mean.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{fine} and PM_{10} ($\mu g/m^3$)

The * Identifies the Exceedances

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{fine} and PM_{10} ($\mu g/m^3$)

The * Identifies the Exceedances